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EDITORIAL CONCLUSION.

Much may be said in reply to Mr. Leo Gilbert's satire; how here and there he slightly twists the propositions of the inventors of the principle of relativity, and how in his exuberant humor he draws consequences which they would not countenance; indeed some of them are actually disavowed. Relativists will probably remind him that according to their claim the velocity of light is the greatest possible velocity, which would cut out some of the best and most humorous comments he makes. Yet we must grant him that no valid reason for this assertion of a truly absolutistic nature has as yet been produced. We feel tempted to make further comments as to what may be said in favor of the new doctrine of the principle of relativity and the half-truths it contains, but we prefer to give the relativists an opportunity to take the stand themselves, although they will probably meet this new attack with complaints that they have been misunderstood and that it is not worth their while to given an answer. To kill with silence (or as the Germans say *Totschweigen*) is the safest mode of defence for a weak cause. Mr. Gilbert claims that this is invariably the method of the relativists, and so for his motto he places on the title page of his book the conjugation of the verb, which he calls the "chorus of the craft":

"Ich schweige tot,
Du schweigst tot,
Er schweigt tot,
Wir schweigen tot,
Ihr schweigt tot,
Sie schweigen tot."

In brief we do not endorse all the conclusions of Mr. Gilbert's criticisms, but we deem his book worth a perusal and a careful reply. The mere humor of it will richly repay the reader for the hour spent thereon. P. C.

EDUARD STUDY'S REALISTIC WORLD-CONCEPTION.

Eduard Study, professor of mathematics in Bonn, has published an essay on "The Realistic World-Conception and the Theory of Space."[1] The task before him is thus formulated on page 62:

"In what consists the epistemological value of the geometrical systems comprised under 'non-Euclidean geometry'? May we regard them as hypotheses of equal or approximately equal value with the Euclidean in respect to the structure of our space? And if so, may we content ourselves with these hypotheses, or shall we not be obliged to make other cautious attempts to approximate the unknown reality, or rather the image of this reality? And is the path of natural science indeed the only one which can procure for us at least some sort of explanation of this natural geometry? Yea, is it indeed a practicable route?"

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[1] *Die realistische Weltansicht und die Lehre vom Raume.* Brunswick. F. Vieweg & Sohn, 1914.

Our author mainly follows Helmholtz, and by "natural geometry" we must understand the results of natural science, especially physics, and the results of these investigations concerning space-relations.

Professor Study proposes four theories of space: 1*a*, spherical geometry; 1*b*, elliptic geometry; 2, pseudo-spherical geometry; and 3, Euclidean geometry which may also be called parabolic geometry. As his conclusion he makes four propositions (pp. 111-112):

"1. However natural geometry may be constructed, no distinction can be made, or only with great difficulty, between it and any other of the four designated kinds of measurement-geometry (*Massgeometrie*) by the aid of our present expedients.

"2. The four kinds of geometry above mentioned are to be preferred among all conceivable hypotheses.

"3. The Euclidean in turn is preliminarily to be preferred among these four hypotheses, and it will continue to be valid where the distances concerned are not too great.

"4. It would be rash to regard as settled the epistemological question of the structure of empirical space.

"By means of their at least very close relation to experience, all four kinds of geometry now possess a particular interest among the infinite multiplicity of geometrical systems which the fancy of mathematicians, 'the mathematical play-instinct,' may contrive. It may be convenient to have one word in common for these four particularly important geometrical systems. We take the liberty to interepret a term coined by Helmholtz in this sense: we shall call the above-mentioned four systems of three-dimensional geometry 'systems of physical geometry,' *cum grano salis* in the systems of abstract geometry applicable to physics."

The book contains incidentally many thoughtful remarks, and is mainly useful for its critical observations, especially of Poincaré's views and also those of Mach. We here quote in translation a few passages on positivism and pragmatism as of special interest (pp. 41-51):

"Indeed the positivists have done an excellent work. What mathematician or physicist would not have derived the richest instruction from Mach's *Mechanics,*[2] that splendid book which cannot be studied carefully and frequently enough, which at each perusal exerts anew its stimulating and refreshing influence! But there is very little in it which a thoughtful realist might not also have said or subscribed to.

"But the 'principle' with which alone we here have to do is criticism and nothing but criticism, pure and indeed downright barren negation, a kind of guillotine or a Procrustean bed which is always too short. The history of philosophy says that it was originally an act of liberation from the excesses of a wild speculation. Perhaps, but why then the exaggeration? To-day we miss in the management of this mechanism the very spirit in whose name it accomplishes, or tries to accomplish, its destructive activity, the spirit of criticism. The 'anti-metaphysical' and 'anti-dogmatic tendency' has itself become an unruly dogma; 'philosophical decrees' are set in opposition to philosophical decrees. It seems to be a universal law that no idea is safe from unlimited exaggeration. Witchcraft, belief in ghosts, spiritism, fourth dimension of space, latticed molecules, ions and electrons, generally speaking matter in the usual sense of the word, apriorism, causality, energies, chemical theories, and I know not how many more—this quite varied company is mercilessly put to death and disappears in the same wholesale grave which is destined for metaphysics and its whole witches' sabbath of near and distant relatives as an unadorned tomb. Death levels all. By its side stands the preacher of positivism who has been ordained for such occasions, and he delivers a funeral sermon which though not exactly pious still is certainly imposing. To the assembled mourners and curious spectators—we had almost said guests—he brings the comforting and exalting message that they are witnesses of an event of cosmic importance. In this moment is dawning a new epoch of civilization, the molecular, etc., superstition is destroyed, the beautiful era of science free from hypotheses and an energetic 'culturology' has begun. Then all go home to the accompaniment of music. One man who stands somewhat aside allowed his thoughts to roam. Liberty, equality, and fraternity came to his mind, and scenes and faces awoke memories within him. It had happened not long before, and it had been almost as beautiful as now. All the more important 'riddles of the universe' had been solved, and at that time they had buried spirit which had become superfluous together with its own witches' sabbath. Some of the personages now being buried were then cruelly slaughtered and lowered in the grave, of course in their character as the offspring of spirit. And then also had dawned a new cycle of civilization stretching on into eternity, the era of a loftier materialistic civilization. How rapidly the civilizations replace each other even to-day! That is progress indeed! And already another funeral train is approaching with the escort of a corresponding civilization, and in the distance another and behind that still another. Pragmatism, activism, intuitionism, or however else the newest mysticism of the *élan vital* may be called, are drawing near, X-ism, Y-ism, Ism, Ism, Ism! Experts even prophesy that Hegelianism will arise once more. At any rate it is a joy to live! Who would trouble his head over questions which so rapidly lose all attraction....

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[2] English translation by T. J. MacCormack. Chicago, Open Court Publishing Company.

"We shall now taste of the sweetest newly-ripened fruit of the tree of knowledge, pragmatism. As early as in Mach we find 'the principle of the economy of thought' repeatedly mentioned. This is at bottom the old practical demand—universally recognized, for instance in mathematics—that the results of science be presented as simply as possible. This is now made into a main principle of cognition and the foundation of all science. Hypotheses which as such must be rejected by the positivists are justified by its aid. It really contains a sound kernel, for the cases have been many from time immemorial where the decision between corresponding hypotheses in the natural sciences has been so made that the simpler was given the preference. But the establishment of the theory that the simplest hypotheses are always the best has turned out so inadequately with Mach that one of his opponents proposed the formulation: It saves thought to assume that the thought which saves thought is the correct one....

"The critical point of the affair is apparent in a more general application which Mach has already given to the same thought. It is biologically advantageous (for the profit of humanity) to make the simplest hypotheses....

"The American and English pragmatists Dewey, James and F. C. S. Schiller have developed this conclusion derived from the theory of biological advantage into the form of a so-called theory of truth. We can notice here, and not unjustly, a terminological misuse. The above mentioned authors might equally well deny the existence of truth altogether. However, on what it depends and what particularly concerns us here is the assertion of the subjective character of all scientific criteria whether or not they are called the criteria of truth: and thus far pragmatism is really a consequence of the theory of biological advantage, and indeed its necessary consequence, if this theory can be said to have any comprehensible meaning at all.

"According to James the individual must balance pleasure and pain against each other, and in so doing he attains a conception of truth, or a criterion of truth (for between the two there is no distinction in pragmatism) and this criterion is valid for himself and is binding on no other person.

"As James himself says, the theories of other pragmatists though differing somewhat in form are essentially in agreement on this point....

"Truth, according to Dewey, is 'that which gives satisfaction' which is obviously a very pleasant conception of truth....

"According to the third representative of pragmatism, F. C. S. Schiller, 'that which works' (following James) is true. By this bewilderingly simple formula the old problem is definitely solved; the 'childish fancy' that there can be a truth independent of ourselves is set aside. But what works to-day does not need to work to-morrow. (*Acqua passata non macina più*). 'An idea is true so long as belief in it is useful for our life' (James). Hence we have here the biological advantage as a utility for 'our' life and at the same time the correct insight that the scientific criteria deducible from it (the so-called criteria of truth) must vary according to time and circumstances. Truths, or what the pragmatist calls truths, come, continue and pass like living creatures; the truths themselves, not our knowledge of a (realistic) truth. But since the pragmatist recognizes and allows only his own conception of truth we must rejoice that, for instance, the Pythagorean proposition still seems to some extent to be useful, otherwise we ought to abolish it on the spot!

"Thus 'does pragmatism loosen all our theories. It has indeed no prejudices, no dogmas that block the way, no strict canon for the demonstrative force of arguments.' It does not 'cling' to logic, and therefore (if we are permitted still to draw logical conclusions) on proper occasions goodnaturedly would let two and two be equal to five. Therefore 'it possesses a great advantage in the religious domain.'

"This 'thoroughly joyous philosophy' commends itself particularly to large circles of people from the fact that it 'extends the realm in which man can seek God,' and that it is 'democratic.' Indeed it seems to have been copied from the form of government of the United States: a philosophy of the people, for the people, by the people. Let every one come and join....

"To be sure it has already been known that the ideals of the old world culture are 'childish fancy' and that the hitherto so-called science which paid no heed to utility can for the most part be thrown on the rubbish heap. But that such a gospel could be proclaimed on this side of the Atlantic (Europe) is a new idea and a particularly painful one.

"It is conceivable that such things need not be said twice to the 'pragmatically so successful' daily press, especially in the land of unlimited possibilities. Who will doubt that a theory of truth which dispenses on demand, not only milk, butter and cheese but 'religious consolation' as well, would not awaken interest and applause everywhere, even among the laity? Even Herr Ostwald who is inspired by pragmatism (as might be expected) reports how stirringly the lectures of James have affected the whole(?) of intellectual New York....

"To be sure, that the 'bread-and-butter standpoint' corresponds exactly to pragmatistic principles, the pragmatists are not at all aware. James even speaks of shameless slander. By our citations we have placed the reader in a position to judge for himself.... No, the cause of pragmatism's ill luck lies in pragmatism itself, in its principle, and in the jelly-like consistency of its jelly-fish philosophy which dissolves under close scrutiny.

"Pragmatism, which appeals to every one, ought to take account also of the dark side of human nature. This theory which pretends to be a philosophy of life must pay particular heed to its probable effects, to its own 'pragmatic results.' Is there any horrible deed which could not be and has not been proved to be 'pragmatically successful?' Not only people of low 'ideals,' but a conquistador or high inquisitor might have appealed to the pragmatic principles if he had the good fortune to have lived at a time when this philosophy was in existence. 'Nothing is true and everything is allowable.' This is the device which pragmatism ought to choose if it would keep its consequences in sight. But the pragmatist does not possess a mirror, and, more than that, like the goddess of justice he has a bandage on his eyes. Who can be blamed for not taking seriously philosophers whose wisdom (*inter alia*), is equivalent to saying that there are as many and more kinds of 'science' than there are religious sects!

"Still if a critique regardless of consequences is desired, we need only to be reminded that in every-day life there are also uncomfortable and even quite dreadful truths, truths which are none the less truths for all that; granite truths which can neither be shaken nor interpreted away, and against which all pragmatic balances and dialectic feats are powerless."

The strength of the author lies apparently in his critical powers. His positive suggestions will probably not be considered as helpful, yet the book is suggestive and pleasant reading throughout. P. C.

RECENT PERIODICALS.

The number of *Scientia* (*Rivista di Scienza*) for September, 1913, begins with an article by Aldo Mieli on the theory of substances with the pre-Socratic—this would be better described as pre-Aristotelian—Greeks. The first part, which is here published, contains an examination of those theories which were intended to explain the unceasing transformations of substances in nature, from the earliest speculations to Empedocles and including him. At the time of Empedocles's appearance, the problem was: all transformations being deceptive appearances of the senses, to seek what is true and stable behind all these false appearances. The solution of the problem, curiously enough, is obtained for the greater part by the adoption of a doctrine which had failed in geometry, the doctrine of the Pythagoreans (as Paul Tannery and others have shown) that geometrical figures are sums of points. This doctrine was partly destroyed by the discovery of incommensurable lengths and completely by the "triumphant" reasoning of Zeno. Future Greek mathematicians built up their splendid edifice of geometry on new and more secure foundations, but the fundamental conception of the theory of composition out of points passed into the theory of the composition of bodies. Three directions then presented themselves: (1) Empedocles's theory, which admitted of a limited number of primitive substances that are invariables and, by their mix-